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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HIRL, JOSEPH P

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/986,531

Applicant(s)

SHACKLEFORD, J. BARRY

Examiner

Joseph P. Hirl

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 1-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. This Office Action is in response to an AMENDMENT entered May 26, 2004 for the patent application 09/986,531 filed on November 9, 2001.
2. The First Office Action of February 2, 2004 is fully incorporated into this Final Office Action by reference.

Status of Claims

3. Claims 1, 5, 9, 10, 14, and 16 are amended. Claims 1-18 are pending in this application.

Claim Objection

4. The current applicant response is not in accordance with 37 C.F.R. 1.121(c) regarding the proper presentation of claims. While the current response has been reviewed and acted upon, all future office actions will require full compliance with 37 C.F.R. 1.121. In the event that the applicant does not meet the full requirements of 37 C.F.R. 1.121 in future responses, such defective responses will be returned to the applicant for corrective action without any adjustment in time requirements before abandonment.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 10-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The practical application test requires that a useful, concrete and tangible result be accomplished. Claims 10-18 represent abstract methodology and therefore are intangible. In short, the invention set forth in claims 10-18 can be practiced with a pencil and paper. No technology is required by these claims. The consequence is that the claimed subject matter is non-statutory.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 3 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Regarding Claim 3, the concept of addition where there are a plurality of items to be added is indeed serial in nature as indicated by the applicants specification

at page 11, line 1. Regarding Claim 18, the concept of changing out the fitness function (matrix of partial solutions) was not addressed. The Examiner asserts that undo experimentation is required to implement the subject claims.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

9. Claims 1-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Shackleford et al (U.S. Patent 6,185,547, referred to as **Shackleford**).

Claim 1

Shackleford anticipates a solution register containing said potential solution for said genetic algorithm problem therein, said solution register comprising a plurality of component parts thereof (**Shackleford**, Fig. 7; c 4, l 63-64); a plurality of data tables, the number of data tables corresponding to the number of said component parts of said solution register, respective data tables having inputs from two respective ones of said component parts of said solution register, each of said data tables comprising a matrix of partial solutions to said combinatorial genetic algorithm problem the two respective ones of said component parts determining a particular respective partial solution each of said matrices having identical entries therein (**Shackleford**, c 25, l 32-67; Examiner's Note (EN): para 13 above applies; there are a plurality of data tables that correspond to the solution register; test failed chip requires two inputs related to the solution register;

matrix has partial solutions (data); and all rows in the table have the same cost; a genetic algorithm is axiomatically a combinatorial solving process); and an adder connected to each of said plurality of data tables, said adder added respective partial solutions from each of said plurality of data tables, thereby determining the fitness of said potential solution for said combinatorial genetic algorithm problem (**Shackleford**, c 27, l 25-28; EN: a genetic algorithm is axiomatically a combinatorial solving process).

Claim 2

Shackleford anticipates said data tables include partial solutions specific to the sequential order of the potential solution (**Shackleford**, c 25, l 32-67; EN: para 13 applies; a matrix is an ordered array).

Claim 3

Shackleford anticipates said adder adds said partial solutions from the respective data tables in parallel (**Shackleford**, c 25, l 57-59; EN: para 13; see 35 USC 102 rejection above; Shackleford provides an adder).

Claim 4

Shackleford anticipates partial solutions from the respective data tables are added substantially simultaneously (**Shackleford**, c 25, l 57-59; EN: para 13; see 35 USC 102 rejections above; Shackleford provides an adder).

Claim 5

Shackleford anticipates each of said matrices within said data tables comprises an abbreviated matrix of partial solutions to said combinatorial genetic algorithm

problem (**Shackleford**, Fig. 25; EN: a genetic algorithm is axiomatically a combinatorial solving process).

Claim 6

Shackleford anticipates fitness function circuit according to claim 5, wherein said abbreviated matrix contains at least $(n)(n-1)/2$ entries (**Shackleford**, Fig. 25; EN: para 13 applies; for sure there are at least $(n)(n-1)/2$ entries in the matrix).

Claims 7, 12

Shackleford anticipates at least two of the two respective ones of said component parts correspond to different entries within said matrices (**Shackleford**, Fig. 25; EN: para 13 applies; a two dimensional matrix always has two different entries).

Claims 8, 13

Shackleford anticipates all of the two respective ones of said component parts correspond to different entries within said matrices (**Shackleford**, Fig. 25; EN: para 13 applies; a two dimensional matrix always has two different entries which would be component parts).

Claims 9, 14

Shackleford anticipates said combinatorial genetic algorithm problem is the traveling salesman problem (**Shackleford**, c 1, l 19-21; EN: a genetic algorithm is axiomatically a combinatorial solving process).

Claim 10

Shackleford anticipates inputting a plurality of potential solution values into a Solution register, said solution register comprising a plurality of component parts thereof

(**Shackleford**, Fig. 7; c 4, l 63-64); receiving after said step of inputting, at each of a plurality of data tables two respective ones of said component parts of said solution register, the number of data tables corresponding to the number of said component parts of said solution register, each of said data tables comprising a matrix of partial solutions to said combinatorial genetic algorithm problem, each of the matrices having identical entries therein (**Shackleford**, c 25, l 32-67; EN: para 13 above applies; there are a plurality of data tables that correspond to the solution register; test failed chip requires two inputs related to the solution register; matrix has partial solutions (data); and all rows in the table have the same cost; a genetic algorithm is axiomatically a combinatorial solving process); indexing said matrices of partial solutions to said genetic algorithm within said plurality of data tables, the two respective ones of said component parts determining respective particular partial solutions within the respective matrices (**Shackleford**, c 25, l 32-67; EN: para 13 above applies; indexing is axiomatic to a matrix table); and adding, by an adder connected to each of the respective data tables, respective outputs from each of said data tables, whereby the sum of said adder determines the fitness of said potential solution for said combinatorial genetic algorithm problem (**Shackleford**, c 27, l 25-28; EN: a genetic algorithm is axiomatically a combinatorial solving process).

Claim 11

Shackleford anticipates step of receiving, at each of said plurality of data tables, two respective ones of said component parts of said solution register are received substantially simultaneously (**Shackleford**, c 25, l 32-67; EN: para 13 above applies; it

is generic circuit design to achieve table information via the use of an abscissa and ordinate values; one without the other does not achieve much).

Claim 15

Shackleford anticipates said step of receiving at each of said plurality of data tables, two respective ones of said component parts of said solution register correspond to the sequential order of the potential solution values in said solution register (**Shackleford**, c 25, l 32-67; EN: para 13 applies; a matrix is an ordered array).

Claim 16

Shackleford anticipates (a) inputting a plurality of potential solution values into a solution register said solution register comprising a plurality of component parts thereof (**Shackleford**, Fig. 7; c 4, l 63-64); (b) receiving, substantially simultaneously at each of a plurality of data tables two respective ones of said component parts of said solution register, the number of data tables corresponding to the number of said component parts of said solution register, each of said data tables comprising a matrix of partial solutions specific to said genetic algorithm problem, each of the matrices having identical entries therein (**Shackleford**, c 25, l 32-67; EN: para 13 above applies; there are a plurality of data tables that correspond to the solution register; test failed chip requires two inputs related to the solution register; matrix has partial solutions (data); and all rows in the table have the same cost); (c) indexing said matrices of partial solutions to said genetic algorithm within said plurality of data tables, the two respective ones of said component parts determining respective particular partial solutions within the respective matrices **Shackleford**, c 25, l 32-67; EN: para 13 above applies; indexing

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is axiomatic to a matrix table); (d) adding, by an adder connected to each of the respective data tables, respective outputs from each of said data tables in parallel whereby the sum of said adder determines the fitness of said particular potential solution for said genetic algorithm problem (**Shackleford**, c 27, l 25-28); (e) comparing the fitness of said particular potential solution to a fitness threshold (**Shackleford**, c 9, l 54-59); and replacing a prior potential solution from said pool of potential solutions with said particular potential solution if said fitness of said particular potential solution exceeds said fitness threshold, and otherwise deleting said particular potential solution (**Shackleford**, c 9, l 54-59).

Claim 17

Shackleford anticipates said methodology repeating said steps (a) - (f) with another particular potential solution with the same matrix of partial solutions (**Shackleford**, c 1, l 51-55).

Claim 18

Shackleford anticipates said methodology repeating said steps (a) - (f) with another particular potential solution with another matrix of partial solutions, said another matrix corresponding to partial solutions for another genetic algorithm problem (**Shackleford**, c 1, l 51-55; EN: to one of ordinary skill in the art, iteration can run on the basis of a plurality of fitness functions).

Examination Considerations

10. The claims and only the claims form the metes and bounds of the invention.

"Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

11. Examiner's Notes are provided to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but a link to prior art that one of ordinary skill in the art would find inherently appropriate.

12. Examiner's Opinion: Paras 10. and 11. apply. The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The applicant is invited to establish an unequivocal argument that a combinatorial process is not axiomatically part of a genetic algorithm.

Response to Arguments

13. The objection to the specification is withdrawn.
14. The rejection of claims 10-18 under 35 USC 112, first paragraph, as cited in the First Office Action, dated February 2, 2004, at page 3 lines 11-21 and at page 4, lines 1-9 are withdrawn.
15. The rejection of claims 4, 11, and 16 under 35 USC 112, second paragraph is withdrawn.
16. Other Applicant's arguments filed on May 26, 2004 related to claims 1-18 have been fully considered but are not persuasive.

In reference to Applicant's argument:

In addition, the Examiner rejected claims 10-18 as directed to non-statutory subject matter citing the "practical application test" requiring that a "useful, concrete and tangible result" be accomplished. Additionally, the Examiner further asserts that these claims represents "abstract methodology and therefore are intangible". Applicant respectively submits that the Examiner's assertions are conclusory and lack analysis thus a prima facie case has not been established. To further the prosecution of the case, the Applicant will provide the analysis lacking in the Examiner's assertion to show that: these claims are well within statutory subject matter and the rejection is unsupportable.

First, Applicant would like to point out that claims 10-18 are directed towards a method of manipulating a particular circuit embedded in computer thus is notoriously patentable subject matter under 35 USC 101. For example, amended claim 10 supports this analysis and recites "A method for determining the fitness of a potential solution for a combinatorial genetic algorithm problem" and that this method includes at least the operations of "inputting a plurality of potential solution values into a solution register" and "adding, by an adder connected to each of the respective data tables". The language and context of this claim clearly indicate that the Applicant is claiming a permissible method claim as it relates to operating computing machinery and circuitry and as both registers and adders are recognized as being very real and tangible parts of a digital electronic circuitry. As explained below, "useful, concrete and tangible result" are clearly accomplished.

In *State Street Bank & Trust Co., v. Signature Financial Group, Inc.*, 149 F.3d 1368, 47 U.S.P.Q.2d (BNA) 1596 (Fed. Cir. 1998), the Federal Circuit articulated the following test for patentability under this section developed from *In re Alappat*, 33 F.3d 1526; 31 U.S.P.Q.2d (BNA) 1545 (Fed. Cir. 1994), and *Arrhythmia Research Technology, Inc., v. Corazonix Corp.*, 958 F.2d 1053; 22 U.S.P.Q.2d (BNA) 1033 (Fed. Cir. 1992). A claim defines subject matter eligible for patent protection if the claim contains a practical application or, equivalently, if the invention defined by the claim produces "a useful, concrete and tangible result."

1. A result is useful if it lies within the technological arts.
Although the court in *State Street* did not further define the term "useful," courts have previously

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interpreted "useful" as meaning "in the technological arts. See *Evans v. Eaton*, 16 U.S. 454; 4 L. Ed. 433; 3 Wheat. 454 (1818) (explaining that "a patent may be for a new and useful art; but it must be practical"); *In re Toma*, 575 F.2d 872, 197 U.S.P.Q. (BNA) 852, - (C.C.P.A. 1978) (holding that a "method for enabling a computer to translate natural languages is in the technological arts, i.e., it is a method of operating a machine"); *Ex parte Ifeldhuis*, 1992 Pat. App. LEXIS 39 (Bd Pat. App.Int. 1992) (noting; "the distinction between mathematical algorithms which are the basic tools of scientific and technological work and the technological application of scientific principles and mathematical algorithms which further the constitutional purpose of promoting the progress of science and the useful arts.").

In the instant case, computations performed by the method recited in claim 10 are directed toward solving a combinatorial class of problems using circuitry designed in accordance with the well known principles of genetic algorithm analysis. In particular, it is the fitness function recited in claim 10 that provides the result used in the combinatorial class of problems encountered by computer systems as recited in claim 10 scheduling planes, trains, shipping containers, computing resources, and other resources in an optimal manner. The traveling salesman problem or TSP is merely a shorthand way of referencing this class of problems by those skilled in the art; the reference to NP complete combinatorial problems is a more technological description of this problems. In either case, the problem clearly occurs in the technological arts and requires carefully designed systems and methods of operating as recited in claim 10.

2. A result is concrete or tangible, and thus not abstract, if it lies within *the physical realm*.

The terms "tangible" and "concrete" come from the *Alappat* case. In that case, the Federal Circuit explained that "abstract ideas" were "disembodied," or Applicant : Shackleford, J. Barry Atty Dkt, : 10008128-1 Issued : n/a Serial No. : 09/986,531 Filed : 11/9/2001 Page : 8 divorced from physical manifestations. Patentable subject matter, on the other hand, was tangible and concrete.

Given the foregoing, the proper inquiry in dealing with the so called mathematical subject matter exception to § 101 alleged herein is to see whether the claimed subject matter as a whole is a disembodied mathematical concept, whether categorized as a mathematical formula, mathematical equation, mathematical algorithm, or the like, which in essence represents nothing more than a "law of nature," "natural phenomenon," or "abstract idea."

149 F.3d at ___, 47 U.S.P.Q.2d (BNA) at ___. Claims to a specific machine that lies in the physical realm, however, are not abstract, as the Federal Circuit explained:

Although many, or arguably even all, of the means elements recited in claim 15 represent circuitry elements that perform mathematical calculations, which is essentially true of all digital electrical circuits, the claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine for converting discrete waveform data samples into antialiased pixel illumination intensity data to be displayed on a display means. n23 This is not a disembodied mathematical concept which may be characterized as an "abstract idea," but rather a specific machine to produce a useful, concrete, and tangible result.

As previously described, claim 10 not only recites using registers and adders but also refers to a specific machine that solves the combinatorial class of problems associated with scheduling; referred to as the Traveling Salesman Problem (TSP). Despite the simple name, this

so-called TSP problem is a class of problems that arises in many different technological context and remains difficult to solve quickly as it is in fact NP complete. Various potential solutions to the TSP problem are suggested to the fitness function recited in claim 10 which in turn converts the potential solution into a number that determines the fitness or relative value of the solution. Accordingly, the

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present invention provides a practical and effective method of selecting an optimal allocation of resources whether it is on a computer chip or in the scheduling of railways or other technological arts. Clearly, claim 10 is not an abstract concept as it is not only uses registers and adders in the physical realm but is grounded in physical manifestations as it solves the physical problem of scheduling resources in an optimal manner.

Examiner's response:

Para 13. applies. To one of ordinary skill in the art, it would be apparent that the phrase "...manipulating a particular circuit embedded in computer..." is nowhere to be found in claims 10-18 and for the reasons stated in the First Office Action, claims 10-18 are rejected under 35 U.S.C. 101. While the problem may be trivial, the claims 10-18 can be implemented with pencil and paper. There is no claimed embodiment in the technical arts. From Merriam-Webster's Collegiate Dictionary, Tenth Edition, 1998, page 984, a register is defined as: "a written record containing regular entries of items or details."

In reference to Applicant's argument:

Regarding claims 3 and 18, the Examiner rejected these claims under 35 USC 112, first paragraph for allegedly failing enablement. Specifically, the Examiner asserts that page 11, line 1 indicates the addition is done in serial rather than in parallel as recited in claim 3. Regarding page 11, line 1 mentioned by the Examiner, this reference indicates the "particular distance a traveler must make to visit all of the cities in that order" and does not support the Examiner's assertion. Instead, Applicant respectfully submits that one skilled in the art would clearly see FIG. 4 as at least one approach that teaches the parallel addition; at least this reference in the specification satisfies 35 USC 112, first paragraph for claim 3.

The Examiner also asserts that claim 18 fails enablement under 35 USC 112, first paragraph because the changing out the fitness function or matrix of partial solutions was not addressed. This is also clearly an incorrect assertion with no support. Specifically, the Applicant notes that a matrix of partial solutions is described at least on page 9, lines 4 to 13; page 9, lines 28-34, page 10, lines 1-34 and elsewhere in the application. One skilled in the art would readily understand that the word 'grid' is synonymous with the word 'matrix' or 'table' as used in the specification and therefore understand this teaching. Likewise, the specification clearly teaches one skilled in the art that a matrix of partial solutions would result when connecting a matrix to one part of a register having a complete 'solution' as disclosed in FIG. 4 and on at least page 8, lines 4-16.

Examiner's response:

Regarding claim 3, the specification @ page 11, line 2, cites "... in that order" which would establish a serial operation. Fig. 4 is ambiguous to type of operation (serial or parallel). The Examiner notes that the applicant has not referenced the specification where "grid of partial solutions", or "matrix of partial solutions" or "table of partial solutions" can be found. The rejection of claims 3 and 18 under 35 USC, first paragraph, remains.

In reference to Applicant's argument:

Regarding substantive rejections, the Examiner rejected claims 1-18 under 35 USC 102(e) as anticipated by Shackleford (US Pat. 6,185,547). Specifically, the Examiner cites FIG. 7; Col. 4, lines 63-64 of Shackleford as describing a plurality of component parts therefore. Applicant respectfully submits that the Examiner's assertion is incorrect as this portion of Shackleford describes a 'least-fit chromosome register' portion of a genetic algorithm architecture and not the 'fitness function' circuitry as recited in claim 1. For at least this reason, . Shackleford does not anticipate claim 1 as amended.

Examiner's response:

Para 13. applies. The title of Shackleford's art is Fitness Function Circuit. Shackleford @ col 12, lines 24-25 cites: "Fig. 7 shows a block diagram of the least-fit chromosome hold circuit 91 as part of the selector 40 in detail." Applicant's related terminology in the subject claim is: "solution register" and not "fitness function." Hence the cited prior art applies since "least fit chromosome register" is a solution register.

In reference to Applicant's argument:

Even if the above reference in Shackleford did describe a fitness function, the Examiner's assertion that Col. 25, lines 32-67 of Shackleford anticipates claim 1 is also unfounded. Instead, Col. 25, lines 32-67 describes a fitness function and hardware circuit specifically for solving a set coverage problem (Col. 25, lines 21-27) and not the "combinatorial genetic algorithm problem" as recited in amended claim 1. The set coverage problem in Shackleford is significantly different from the "combinatorial genetic algorithm problem" recited in claim 1 and thus Shackleford does not teach, or even suggest, this fitness function as asserted.

Examiner's response:

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Para 13. applies. Shackleford teaches a GA framework and @ col 25, lines 23-24 cites the following: "The fitness function circuit inputs n-bit chromosomes and outputs their evaluated values of fitness." A genetic algorithm is axiomatically combinatorial.

In reference to Applicant's argument:

It is further asserted by the Examiner that Col. 27, lines 25-28 of Shackleford describe the "combinatorial genetic algorithm problem" in claim 1. Applicant respectfully disagrees. Col. 7, lines 25-28 of Shackleford describes a carry-save adder for chromosomes yet this is only a portion of the fitness function being described by Shackleford. Once again, the fitness function in Shackleford describes a fitness function for a set coverage problem and this carry-save adder is just one component for this purpose and it does not teach a fitness function for the "combinatorial genetic algorithm problem" as recited in claim 1 as amended.

Examiner's response:

Para 13. applies. The applicant's cited reference follows as part of Shackleford's Embodiment 2 cited immediately above where the combinatorial features follow the functionality of a genetic algorithm.

In reference to Applicant's argument:

Independent claims 10 and 16 are also fitness functions used for "combinatorial genetic algorithm problem" and for at least the same reasons as claim 1 also are in condition for allowance.

Examiner's response:

Para 13. applies. Simply stated, all genetic algorithm problems are combinatorial by the nature of their fundamental operation. Should the applicant believe otherwise, the applicant is invited to demonstrate in detail how the disclosure sets forth a

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combinatorial process that is patentably distinct over either Shackleford or a genetic genetic algorithm.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Claims 1-18 are rejected.

Correspondence Information

19. Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner, Joseph P. Hirl, whose telephone number is

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(703) 305-1668. The Examiner can be reached on Monday – Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Anthony Knight can be reached at (703) 308-3179.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

or faxed to:

(703) 746-7239 (for formal communications intended for entry);

or faxed to:

(703) 746-7290 (for informal or draft communications with notation of "Proposed" or "Draft" for the desk of the Examiner).

Note: During the last two weeks of October 2004, Art Unit 2121 will move to Carlyle, Randolph Building, 5th floor and my phone and fax number will change to: 571-272-3685 and 571-273-3685, respectively. Similarly, Anthony Knight's phone and fax numbers will change to: 571-272-3687 and 571-273-3687.


Joseph P. Hirl

September 2, 2004


Anthony Knight
Supervisory Patent Examiner
Group 3600